REMARKS

In response to the Office Action mailed September 16, 2003, Applicants respectfully request reconsideration. To further the prosecution of this application, amendments have been made to the claims, and the claims as presented are believed to be in allowable condition.

Claims 1-95 were previously pending in this application. Claims 1, 3-5, 6, 14, 15, 31, and 64 are amended herein. Claims 2, 16, 52 and 65 are canceled. As a result, claims 1, 3-15, 17-51, 53-64 and 66-95 are pending for examination with claims 1, 3-6, 15, 31, 36, 48, 64, 67, and 86 being independent.

Objections to the Specification

In paragraph 2, the Office Action objected to the specification, asserting that the phrase "of the design matrix an the at least one design parameter" at page 4, line 29 is unclear. Applicants have amended this phrase to recite "of the design matrix and the at least one design parameter." Accordingly, it is respectfully requested that this objection be withdrawn.

In paragraph 3, the Office Action objected to the phrase "of the design matrix an the at least one design parameter" in claim 31. Applicants have amended claim 31 to recite "of the design matrix and the at least one design parameter." Accordingly, withdrawal of the objection to claim 31 is respectfully requested.

Objections to the Claims

In paragraph 4, the Office Action objected to claim 14, asserting that there is a missing list of elements in the claim. Applicants have amended claim 14 to include a list elements. Specifically, the list of elements includes a summation junction, a control junction, and a feedback junction. No new matter is added by this amendment as support for this amendment may be found in Applicants' specification at page 3, line 24.

In paragraph 5, the Office Action objected to claim 15 "because it is practically a replica of claim 6 in terms of the limitations recited." Applicants have amended claim 15 to incorporate the limitations of claim 16 and have canceled claim 16 without prejudice or disclaimer. Accordingly, it is respectfully requested that the objection to claim 15 be withdrawn.

In paragraph 6, the Office Action objected to claim 52 under 37 C.F.R. §1.75(C) asserting that claim 52 "recited exactly the limitations recited in the base claim." Applicants have canceled claim 52. Accordingly, withdrawal of the objection to claim 52 is respectfully requested.

Rejections under 35 U.S.C. §112

In paragraph 8, the Office Action rejected claims 14, 15, 16-30, and 65 under 35 U.S.C. §112, second paragraph.

Specifically, the Office Action asserted that claim 14 is incomplete because "no follow up elements are recited to further specify the context enclosed with a ':'." Claim 14 has been amended to address this issue. Accordingly, it is respectfully requested that the rejection of claim 14 under 35 U.S.C. §112 be withdrawn.

The Office Action rejected claim 15, asserting that there is insufficient antecedent basis for "the software system." The Office Action further rejected claims 16-30 for being dependent upon claim 15. Applicants have amended claim 15 to overcome this rejection. Accordingly, withdrawal of the rejection of claim 15 under 35 U.S.C. §112, second paragraph is respectfully requested.

The Office Action rejected claim 65, asserting that the phrase "the design specification" lacks antecedent basis. Claim 65 has been cancelled. Accordingly, withdrawal of the rejection of claim 65 under 35 U.S.C. §112, second paragraph is respectfully requested.

Rejections under 35 U.S.C. §103

The Office Action rejected claims 1 and 64 under 35 U.S.C. §103(a) as purportedly obvious over Richburg (U.S. Patent 5,159,687) in view of Underwood (U.S. Patent 6,523,027). and claims 2-13, 15-63, and 65-94 as purportedly obvious over the combination of Richburg and Underwood, further in view of Rudolph ("On a Mathematical Foundation of Axiomatic Design," 1996 ASME Design Engineering Technical Conference and Computers in Engineering Conference, 8/22/96). Applicant respectfully traverses each of these rejections. First, the combination of references is improper. Second, even if one were to combine the references Applicants' claims still distinguish over any such combination.

Discussion of the References

Richburg (5,159,687)

Richburg is directed to a method and apparatus for generating program code files. The system of Richburg includes two primary input elements. These two elements are application database files and knowledge base files (column 5, lines 7-9). The knowledge base files include program code in the most general form for solution of a problem (column 5, lines 45-47). The application database files include the requirements of the specific application. A program processor uses the instructions from the knowledge base file along with information in the application database files to generate an output file (column 6, lines 10-14). The output file includes code from the knowledge base files customized to a particular application as specified by the application database files (column 6, lines 14-22).

Underwood (6,523,027)

Underwood is directed to interfacing servers in a java based e-commerce architecture. The Abstract of Underwood discloses a first server and second server with a proxy component situated therebetween. A request for a business object is identified by an application on the first server. The first server is then connected to the second server. Next, a selection criteria from the first server is transmitted to the second server. In response to the selection criteria, the first server receives a first recordset and a second recordset from the second server. Business data is included in the first recordset and result codes are included in the second recordset. The first and second recordsets are mapped to the business object and the business object is sent to the application on the first server.

Rudolph ("On a Mathematical Foundation of Axiomatic Design," 8/22/96)

Rudolph is directed to a mathematical framework for axiomatic design which allows replacing the independence and information axioms with the so-called evaluation hypothesis (page 1). Rudolph further discloses that the axiomatic design approach includes specifying a design matrix that maps between the functional requirements and the design parameters of a design (page 2). Rudolph **does not** disclose applying axiomatic design principles to the design

of software. Indeed, Rudolph only discloses applying axiomatic design principles to the design of mechanical devices and the only example provided by Rudolph is applying the axiomatic design approach to the design of a molding machine (page 3). **Nowhere does Rudolph disclose or suggest applying axiomatic design principles to the design of software.**

I. The Combination of References is Improper

The rejection of Applicants' claims is improper because there is nothing in Richburg or Underwood that would have motivated one of skill in the art to combine the references Richburg and Underwood. Further, there is no additional teaching or suggestion that would have motivated one of skill in the art to combine Richburg and Underwood with Rudolph.

A. The Combination of Richburg and Underwood

The Office Action asserts that "it would be obvious for a skill in the art at the time the invention was made to modify Richburg's method to map functional requirements as suggested above by Underwood to the specified code design parameters or inputs by the developers as suggested by Richburg. The motivation would be obvious since code is generated to implement or fulfill business functionalities or a set of target functions. Hence functional requirements are first to be considered with validating with respect to design specification (Office Action, pages 4-5)." The Office Action also asserts that "[i]t would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the information database to support the code processing as taught by Richburg so to add the detailed design information describing the software system structure and operating qualities as suggested by Underwood, because this would provide better informative data for further design improvement and/or reuse based on existing software operation information acquired from detailed description or metadata/legacy of previous code implementations."

Applicants respectfully disagree with the purported motivation for combining the references. First, it is unclear how one would of skill in the art would have modified the automatic code generation system of Richburg based on the method of interfacing servers as taught by Underwood and if such a modification is even possible. If the rejection is to be maintained, Applicants respectfully request clarification on how the Examiner believes one of

skill in the art would have modified the automatic code generation system of Richburg based on the method for interfacing servers in an e-commerce architecture, as taught by Underwood. In particular, Applicants respectfully request clarification on what the system resulting from the combination would include.

Second, assuming that the combination of Richburg and Underwood is possible, there is no motivation to make such a combination. MPEP §2142 requires that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." MPEP §2142 page 2100-124 of original 8th Edition, rev. 1, Feb. 2, 2003. There is nothing in Underwood that suggests there is any problem or shortcoming with automatic code generation systems or, in particular, the automatic code generation system of Richburg. Indeed, Underwood is directed to the unrelated endeavor of interfacing servers in an e-commerce architecture. There is no disclosure or suggestion in either reference that would have motivated one of skill in the art to modify Richburg's system for automatic code generation based on Underwood's unrelated disclosure of a method for interfacing servers in an e-commerce architecture.

B. The Combination of Richburg, Underwood, and Rudolph

Further, the combination of Richburg and Underwood with Rudolph is also improper. The Office Action asserts that "it would have been obvious for one of ordinary skill in the art at the time the invention was made to implement to the mapping thus disclosed by Underwood/Richburg in establishing correlation between design and requirements so to add instructions code for generating a matrix structure using axiomatic approach as mentioned by Rudolph because this manipulation of the matrix into some desired patterns (e.g. coupled, uncoupled, decoupled) for matching the requirements to the design resources would further enhance the optimization of resources while fulfilling the functional requirements as implemented by the design (Office Action, page 7)."

Applicants respectfully disagree with this assertion. As discussed above, Rudolph discloses applying axiomatic design principles to mechanical systems. **None of the cited references disclose or suggest applying such design principles to the design of software code**

and the automatic generation of software code. Rudolph discusses axiomatic design only in the context of mechanical systems and neither Richburg or Underwood even mention axiomatic design. Further, none of the cited references explain how axiomatic design principles may be applied to the art of software design. Indeed, the only suggestion of applying axiomatic design principles to the design of software comes from Applicants' own disclosure.

Because there is no motivation to combine the cited references, withdrawal of the rejections under 35 U.S.C. §103 is respectfully requested.

II. Even if One Were to Combine the References, Applicants' Claims Distinguish Over Any Such Combination

A. Claim 1

Claim 1 was rejected under 35 U.S.C. §103(a) as purportedly obvious over Richburg and Underwood. However, claim 1 has been amended to incorporate the limitations of claim 2, which was rejected under 35 U.S.C. §103(a) as purportedly obvious over the combination of Richburg and Underwood further in view of Rudolph. Claim 1, as amended, patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination.

Claim 1 as amended recites, "a digital information product comprising: a computer-readable medium; and stored on the computer-readable medium, computer program instructions defining a software system that produces software code based on a set of functional requirements and design parameters provided by a programmer, wherein the computer program instructions, when executed, allow the programmer to define a design matrix describing a relation between the set of functional requirements and the design parameters."

None of the references discloses or suggests "a software system that produces software code based on a set of functional requirements and design parameters provided by a programmer, wherein the computer program instructions, when executed, allow the programmer to define a design matrix describing a relation between the set of functional requirements and the design parameters."

The Office Action does not explain what system is believed to result from the combination of Richburg and Underwood with Rudolph. However, combining these references is analogous to combining a first reference that discloses an automobile engine with a second reference that discloses automobile brakes. The resulting combination would be an automobile having the engine disclosed by the first reference and the brakes disclosed by the second reference. Thus, because Richburg is directed to the automatic generation of software based on a set of application database files and knowledge base files and Rudolph is directed to the unrelated design of mechanical systems using axiomatic design principles, the resulting combination would be one in which the software system of Rudolph is used to generate software code while the axiomatic design principles of Rudolph are used to design mechanical systems.

Consequently, none of the references, whether taken alone or in combination, discloses or suggests a design matrix describing a relation between a set of functional requirements and design parameters, wherein software code is automatically produced based on those functional requirements and design parameters. Therefore, claim 1 patentably distinguishes over Richburg, Underwood and Rudolph. Accordingly it is respectfully requested that the rejection of claim 1 under 35 U.S.C. §103(a) be withdrawn.

Claims 3-5 have been amended to correct their dependency from canceled claim 2. Claims 3-5 now depend from claim 1 and are patentable for at least the reasons discussed above in connection with claim 1. Accordingly, it is respectfully requested that the rejection of claims 3-5 be withdrawn.

B. Claim 6

Claim 6 is directed to a method for producing a software system. The method comprises: "defining a design matrix describing a relation between functional requirements of a software system and design parameters; and generating software code based on the design matrix."

As should be clear from the discussion above, claim 6 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests generating software code based on a design matrix. Accordingly, withdrawal of the rejection of claim 6 under 35 U.S.C. §103(a) is respectfully requested.

Claims 7-14 depend from claim 6 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 7-14 is respectfully requested.

C. Claim 15

Claim 15 is directed to a method for producing software. The method comprises: defining a design matrix describing a relation between functional requirements of a software system and design parameters so that the design matrix has a lower triangular form; and generating software code based on the design matrix.

As should be clear from the discussion above, claim 15 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests generating software code based on a design matrix. Accordingly, withdrawal of the rejection of claim 15 under 35 U.S.C. §103(a) is respectfully requested.

Claims 17-30 depend from claim 15 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 17-30 is respectfully requested.

D. Claim 31

Claim 31 is directed to a method for designing software involving object-oriented software objects. The method comprises: defining a design matrix describing a relation between a plurality of functional requirements of the software system and design parameters; representing at least one object-oriented object by at least one of the functional requirements; representing data used by the at least one object-oriented software object by at least one of the design parameters; and representing a method of the at least one object-oriented software object by a product of a portion of the design matrix and the at least one design parameter.

As should be clear from the discussion above, claim 31 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests representing a method of the at least one object-oriented software object by a product of a portion of the design matrix and the at least one design parameter. Accordingly, withdrawal of the rejection of claim 31 under 35 U.S.C. §103(a) is respectfully requested.

Claims 32-35 depend from claim 31 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 32-35 is respectfully requested.

E. Claim 36

Claim 36 is directed to a method for designing software comprising: defining a software system by defining a design matrix describing a relation between functional requirements of the software system and design parameters implementing the software system; defining at least one object-oriented object; and defining at least one method that may be defined on the at least one object, wherein the at least one object-oriented object and the at least one method are related to the design matrix.

As should be clear from the discussion above, claim 36 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests defining a design matrix describing a relation between functional requirements of the software system and design parameters implementing the software system. Accordingly, withdrawal of the rejection of claim 36 under 35 U.S.C. §103(a) is respectfully requested.

Claims 37-47 depend from claim 36 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 37-47 is respectfully requested.

F. Claim 48

Claim 48 is directed to a database format for designing a software system comprising: a software design specification, wherein the design specification defines a design matrix describing a relation between a plurality of functional requirements of the software system and design parameters, wherein the design specification represents at least one software object by at least one of the functional requirements, and wherein the design specification represents data used by the at least one software object by at least one of the design parameters; and software code produced by the design specifications.

As should be clear from the discussion above, claim 48 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests a design specification that defines a design matrix describing a

relation between a plurality of functional requirements of the software system and design parameters. Accordingly, withdrawal of the rejection of claim 48 under 35 U.S.C. §103(a) is respectfully requested.

Claims 48-51 and 53-63 depend from claim 48 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 48-51 and 53-63 is respectfully requested.

G. Claim 64

Claim 64 was rejected under 35 U.S.C. §103(a) as purportedly obvious over Richburg and Underwood. However, claim 64 has been amended to incorporate the limitations of claim 65, which was rejected under 35 U.S.C. §103(a) as purportedly obvious over the combination of Richburg and Underwood further in view of Rudolph. Claim 64, as amended, patentably distinguishes over the cited references, whether taken alone or in combination.

Claim 64 is directed to a database format for designing a software system comprising: design identification information identifying information describing the software system; detailed design description information describing the structure and operating qualities of the software system, wherein the detailed design description information defines a design matrix describing a relation between a plurality of functional requirements of the software system and design parameters, represents at least one software object by at least one of the functional requirements, and represents data used by the at least one software object by at least one of the design parameters; and software code information associated with the software system.

As should be clear from the discussion above, claim 64 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests a database format that comprises detailed design description information that defines a design matrix describing a relation between a plurality of functional requirements of the software system and design parameters. Accordingly, withdrawal of the rejection of claim 64 under 35 U.S.C. §103(a) is respectfully requested.

Claims 66 depends from claim 64 and is patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claim 66 is respectfully requested.

H. Claim 67

Claim 67 is directed to a method for generating software code associated with a software system. The method comprises: defining a design matrix describing a relation between functional requirements of the software system and design parameters; and generating software code based on the design matrix.

As should be clear from the discussion above, claim 67 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests a defining a design matrix describing a relation between functional requirements of a software system and design parameters. Accordingly, withdrawal of the rejection of claim 67 under 35 U.S.C. §103(a) is respectfully requested.

Claims 68-85 depend from claim 67 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 68-85 is respectfully requested.

I. Claim 86

Claim 86 is directed to a computer-readable medium encoded with a program that, when executed on a computer system, performs a method for rendering an interface through which a user may interact. The method comprises steps of: displaying a software design interface, wherein the interface displays a set of functional requirements upon which a software design is based, and wherein the interface displays a design matrix describing a relation between the set of functional requirements and design parameters implementing the software design.

As should be clear from the discussion above, claim 86 patentably distinguishes over Richburg, Underwood, and Rudolph, whether taken alone or in combination, as none of the references discloses or suggests an interface that displays a design matrix describing a relation between the set of functional requirements and design parameters implementing the software design. Accordingly, withdrawal of the rejection of claim 86 under 35 U.S.C. §103(a) is respectfully requested.

Claims 87-95 depend from claim 86 and are patentable for at least the same reasons. Accordingly, withdrawal of the rejection of claims 87-95 is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully Submitted,

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Docket No.: A0734.70001US00
Date: February 17, 2004
x2/16/04x